MILL SECTION of

Concrete

The Mill Edition of CONCRETE is edited for the manufacturers of portland cement, lime and similar products. Its pages are devoted to discussions of plant design, management, operation, production efficiency, chemical research and control, quarry operation, progress and news of the industry.

The Mill Edition also contains all the material published in the corresponding Regular Edition and so provides news of the uses and merchandising of the materials whose manufacture is discussed in the Mill Edition.

The Regular Section furnishes mill operating officials and mill executives valuable points of contact with the users of the materials they produce.

Volume 30 March, 1927 Number 3

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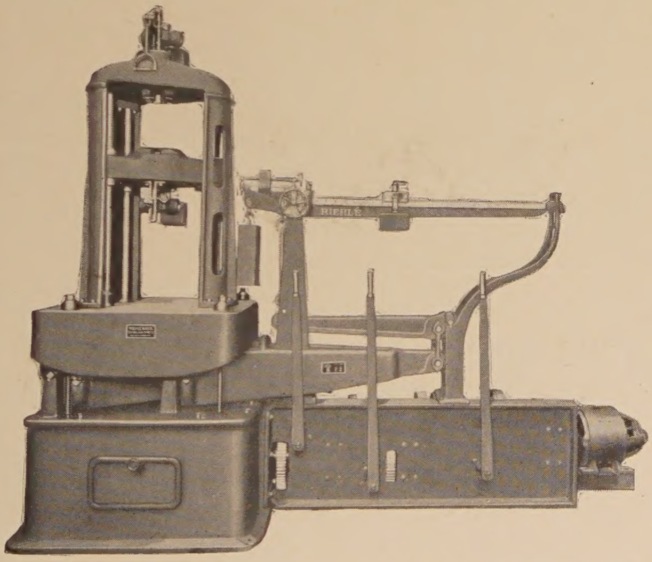

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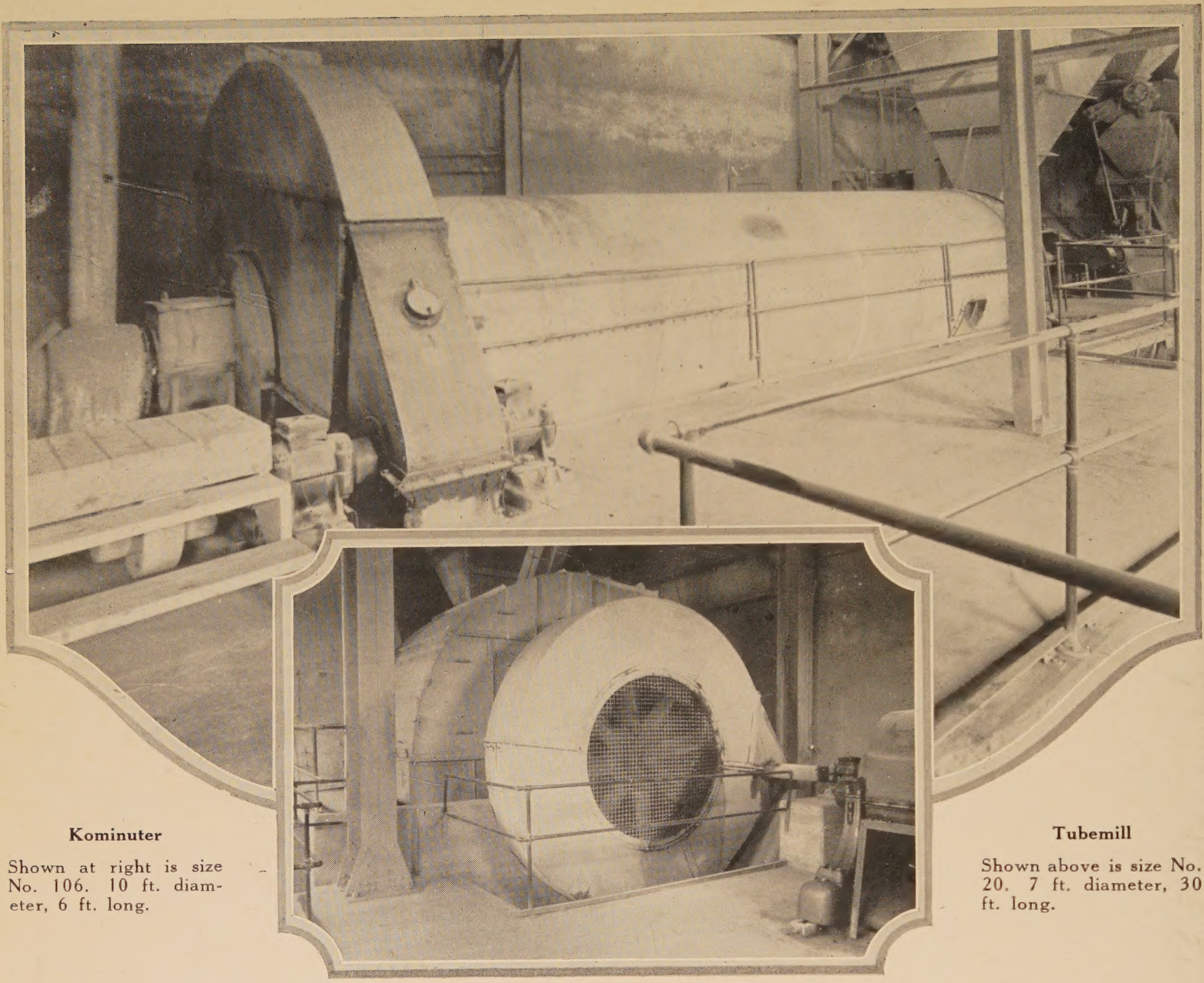

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MILL SECTION of

Concrete

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EDITORIALS

Merchandising Cement

THE men who use cement—contractors of various types and concrete products manufacturers—have in the past generally felt that their product was not a thing that could be merchandised in the ordinary sense. The products man was apt to say, "You can't sell blocks except to those who want them."

And the contractor has been pretty thoroughly convinced that nothing much counted except his bid when he was after a job. The idea of bringing about a situation that might create the job was entirely beyond his horizon.

The situation has in the past been saved by the fine promotion work of the Portland Cement Association. This has created in the mind of the ultimate consumer an attitude toward concrete in all its various forms that has to a large extent solved the sales problems of the contractor and products manufacturer. The result has been a constantly increasing use of cement.

The situation is now changing, however. Competition has reached the point where the individual products man is beginning to wake up to the fact that he must merchandise his own product aggressively if he is to be the man who will supply the blocks used in his community. And at the recent convention of the Associated General Contractors the idea was expressed that it was high time for contractors to begin to secure jobs on the basis of other things than price bids. In other words, the Associated General Contractors have become aware of the fact that they as individuals have a merchandising problem, and that they should begin to talk about dependability and workmanship as well as about price.

This development is very encouraging. But is it not time that the manufacturers of cement also began to merchandise their wares aggressively? A market in which competition has forced the retailer of a product—and that is what contractors and products men really are in respect to cement—to engage in highly aggressive merchandising methods, is certainly no market in which the manufacturer should refrain from such methods.

Cement manufacturers need not fear that their efforts in this direction will be misunderstood. Men who are using aggressive sales methods themselves are not going to misunderstand those methods when employed by the manufacturers from whom they buy their raw materials. They will not only not misunderstand such methods—they will be benefited by them. For the very example of the manufacturer is bound to strengthen the faith which the contractor and products maker is beginning to have in modern methods of merchandising, and to encourage him to go on following the path on which he is now started.

We cannot but feel that it is high time cement manufacturers began to think more seriously about this subject. Too many manufacturers are doing nothing substantial in the way of merchandising their own particular brand of cement. Such manufacturers are certain to be faced with a very real and increasing problem as the merchandising consciousness of the men who buy their cement is developed. Men who are fighting tooth and nail for the business they obtain are not apt to look with any too great favor upon a source of supply which does not seek their business sufficiently to come after it with the same aggressive tactics that they themselves have to use in finding a market for the cement which the manufacturer sells them.

State-Owned Cement Plants

A RECENT report made by C. H. Sonntag to Governor F. W. Green of Michigan, and by him transmitted to the legislature, says among other things that "the state was not justified in taking control of the Chelsea cement plant and purchasing it, for it did not get actual value in exchange."

When the plant was purchased, it was maintained that it was making so much money that it would soon pay for itself. Now the facts disclose that the machinery is obsolete, that operation is wasteful, that costs are too high, and that the product is inferior.

An item recently published in this magazine showed operating losses of the South Dakota state cement plant of more than $63,000.

These facts are particularly interesting now in the light of the proposed state owned cement plant to be built at the Indiana State Farm at Putnamville, Ind. The cement is to be "raised" at the state farm under the direction of the farm's board of trustees. The plan provides that prisoners at the State Farm would be compensated for their work in the proposed cement mill at the rate of $1.50 per day.

The arguments against government ownership are generally known and conceded. The cement industry does not need government subsidy. It is going ahead vigorously with a present production capacity considerably in advance of even the most optimistic estimates of future sales. It is producing a good quality of cement at a fair price. There is no sound reason why any state should feel it necessary to undertake the production of portland cement.

The experiences of South Dakota and Michigan in the cement industry might furnish some valuable information to the proponents of this measure in Indiana and Arizona.

New Federal Cement Plant at Buffalo Nears Completion

Will Use Slag and Limestone as Raw Materials—Located Just Outside Buffalo City Limits on Lake Erie—Has Unusual Transportation Facilities—Filters Will Reduce Moisture Content in Slurry—Compact Layout with Most Modern Equipment

THE new 1,250,000 barrel wet process plant of the Federal Portland Cement Company at Buffalo, N. Y., is nearing completion and is scheduled to begin the production of portland cement about April 1, of this year.

As shown in the accompanying layout, the plant is compactly and efficiently designed, necessitating a minimum of material handling. In every respect, the plant will take advantage of the most modern and approved available equipment and methods.

Location and Shipping Facilities

In the matter of location, the Federal plant enjoys some unusual advantages. It is just outside the corporation line of the city of Buffalo about 7 miles from the center of the city. This feature places the Buffalo market within easy truck hauling distance and the design of the plant makes provision for large shipments by motor truck. The main New York-Cleveland Highway passes the plant.

The plant is located on the shore of Lake Erie, and will have its own docking facilities. These are advantageous both for the receiving of raw materials and the shipment of finished cement. Adequate facilities for water transportation are now under construction.

The tracks of the South Buffalo Railway serve the warehouses of the company. Through this railway, which has connections with all the railways entering Buffalo, adequate rail shipment facilities are assured. In addition, arrangements have been made with the Buffalo and Erie Electric Railway Co., an interurban electric line passing the plant, to handle cement shipments.

In the probable marketing radius of about 150 miles, there is an estimated population of around 3,000,000 people. Truck shipments will serve an area within a radius of about 15 miles from the plant.

Raw Materials

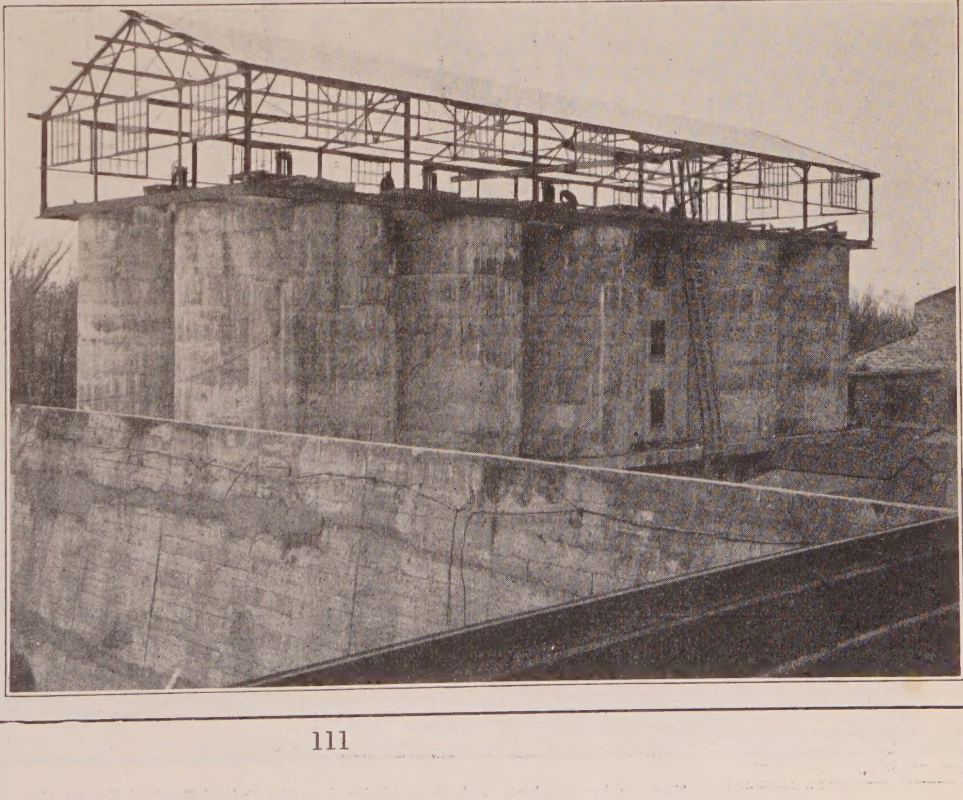
Raw materials will be blast furnace slag supplied locally from the Buffalo Slag Co. and limestone, some of which will be shipped by boat from Rodgers City, Mich., and unloaded at the Bethlehem Steel Company's docks. The slag will come from the steel plants which are only 3 miles away. All materials will be crushed to compeb mill size before they are shipped. Local gypsum will be used.

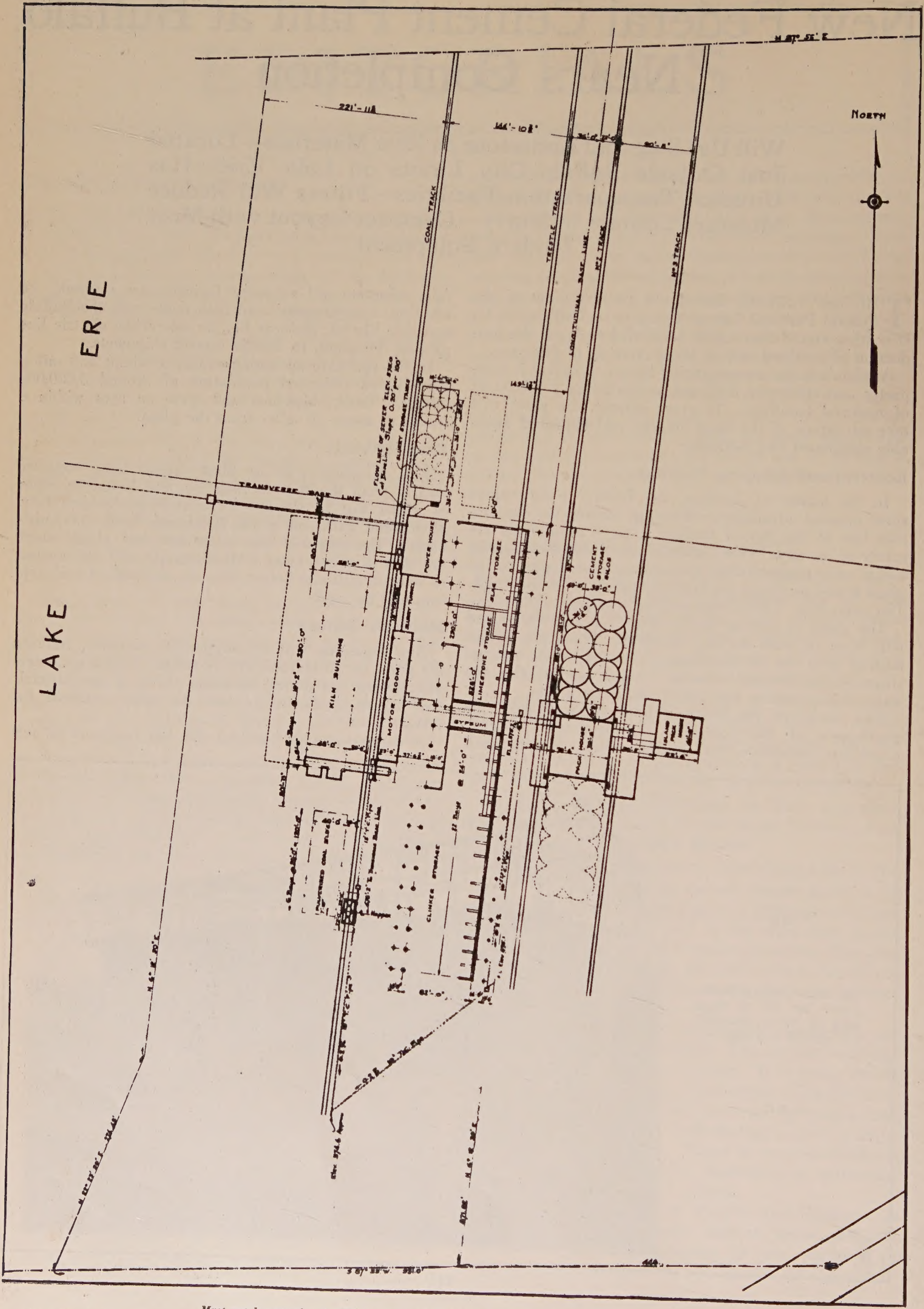
Materials Storage

Raw materials will be shipped in gondolas, entering the plant on an elevated trestle track. This track enters directly into the storage building. From it the materials will be dumped directly into the space reserved for them.

A covered storage building 528 feet long and 82 feet

The slurry storage tanks. There are 10 of these, each 20 feet in diameter and 28 feet high





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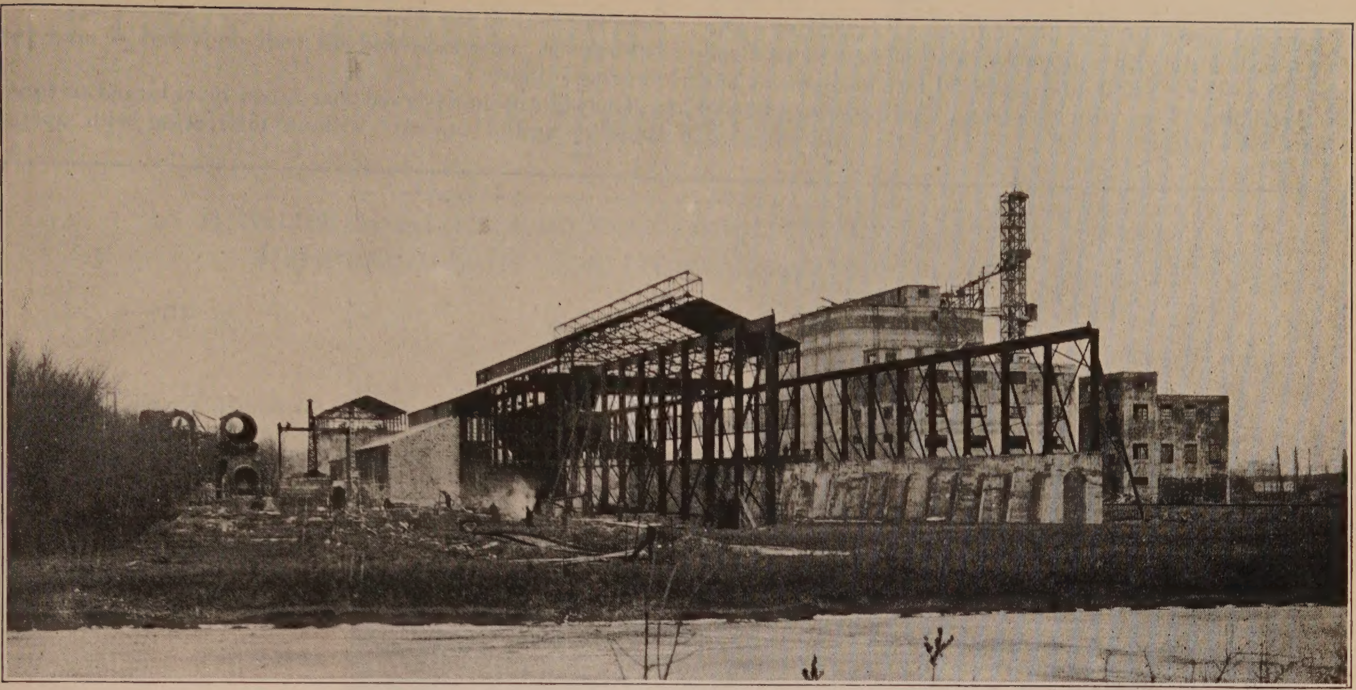


Clinker storage building. A covered storage building, 528 *feet long and* 82 *feet wide is divided into compartments for slag, limestone, gypsum and clinker*

wide has been erected. This is divided into compartments for slag, limestone, gypsum and clinker. Materials will be handled from the stock piles by means of 2 Whiting cranes with 3 cubic yard buckets and dumped into hoppers. The stone and slag are weighed on Shaeffer poidometers before they enter the compeb mills.

Raw End

From the hopper, the raw materials are conveyed to three 3-compartment wet compeb mills where they are pulverized. Leaving the mills, the slurry is pumped by two 6-inch Wilfley slurry pumps to the slurry tanks. There are 10 of these, each 20 feet in diameter and 28 feet high. high.

Two filters, manufactured by the United Filter Corp., Chicago, are being installed. They will reduce the moisture content in the slurry from 40 per cent to 18 per cent before it enters the kilns. This installation is an unusual one, the Ford plant being the only other cement plant now having filters of this type.

Finish End

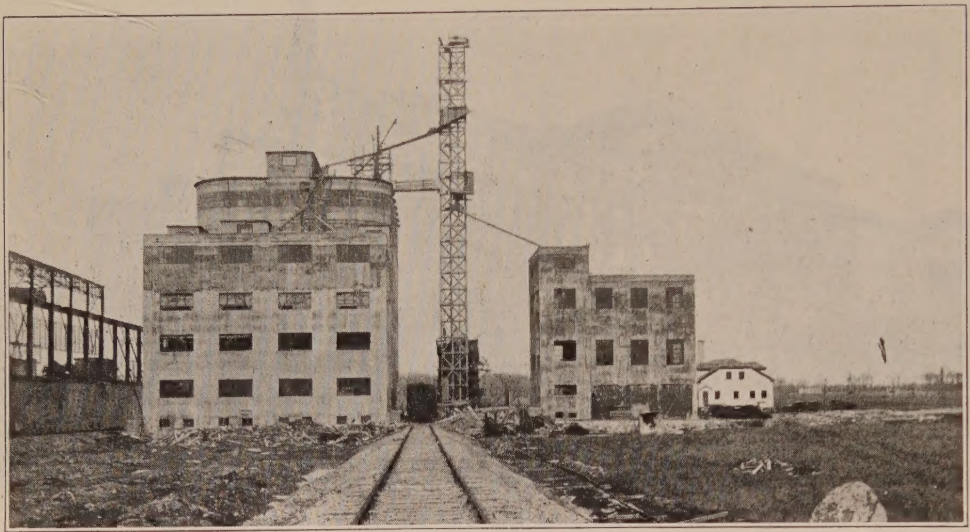
Wilfley slurry pumps convey the slurry from the storage tanks to the kilns.

There are 2 kilns, each 11 feet by 175 feet and 2 coolers, each 8 feet by 80 feet. Both the kilns and the coolers were made by the Allis-Chalmers Company.

A Webster pan conveyor transports the clinker from the coolers to storage. Clinker storage capacity of from 100,000 to 200,000 barrels are provided and there is yard space for additional storage if required. Clinker is reclaimed by an overhead crane with clamshell, and placed into the finish grinding mill bins. Three Allis-Chalmers No. 726 compeb mills grind the clinker. All mills, both on the raw and finish ends are located in one room. Immediately adjacent to this is the motor room.

The kilns and coolers in position. Kilns are 11 *feet by* 175 *feet. Coolers are* 8 *feet by* 80 *feet*

Leaving the mills, the finished cement is picked up by two 6-inch Fuller-Kinyon pumps and carried to the storage silos. There are 8 silos, each 30 feet in diameter and 80 feet high. They provide storage facilities for 200,000 barrels of cement.



On the left are the silos and pack houses. The island pack house, to be used for loading trucks, is on the right of the the track

Pack House

The main, railroad pack house is 70 feet by 70 feet in plan, 4 stories high. Four Bates packers are installed to handle railroad shipments. Two tracks serve the pack house, one on each side of the building.

An overhead bridge feeds the island pack house which is installed for taking care of truck shipments. It is so located and designed that it can be enlarged to handle any required volume of truck deliveries.

Coal Room

Coal is delivered on a separate track and dumped into a hopper near the coal building. It is run through an Allis-Chalmers dryer and pulverized in two 46-inch Fuller-Lehigh mills. A Fuller-Kinyon installation conveys the coal to the kilns.

Power is purchased and all coal delivered is used for burning clinker.

The plant is so designed that it can be enlarged to three times its initial capacity without interfering with operation. All mill machinery and motors were purchased from the Allis-Chalmers Company.

Personnel

Officers of the Federal Portland Cement Company are: L. A. Beeghly, president; W. E. Bliss, vice president; W. H. Kilcawley, vice president; H. N. Snyder, secretary and treasurer; J. A. Harding, general manager and H. A. Leonard, superintendent. Messrs. Beeghly, Bliss and Kilcawley are located at Youngstown, Ohio. Messrs. Snyder, Harding and Leonard are located at Buffalo, N. Y.

The contractors who built the plant are: E. P. Muntz of Buffalo, concrete work; Lackawanna Steel Construction Co., steel buildings, and M. A. Long Co., of Baltimore, silos and pack house.

Two Japan Plants Propose Expansion; Break in National Organization Near

Tokyo, Japan—Cement circles are greatly concerned over the plans of two large companies here to establish new factories in the Hokkaido for the making of high-grade cement. One of these plans is backed by Soichiro Asano, president of the Asano Cement Company, and the other is fostered by the Iwaki Cement Company.

For several months the 19 cement firms of Japan, all members of the Japan Cement Association, have restricted production in order to maintain the price. This has not been by clandestine agreement, but openly, as these aids to trade are sanctioned and even encouraged by the Japanese government. The restriction has proved irksome to some of the more powerful concerns and there are rumors that the proposed establishment of the new companies is merely a move for the abrogation of the agreement.

The smaller companies see in the proposed new companies merely a move on the part of Asano and Iwaki to get around the restrictions and increase their productive capacities at the expense of the smaller mills. The 17 other concerns recently sent representatives to a meeting at which the problem was discussed and a resolution adopted warning Iwaki and Asano to drop their plans under pain of being expelled from the Association. As the two companies, combined, are much more important than all the others put together, such a step would have the effect of breaking up the association and allowing unrestricted production once more. The situation is quite tense and important developments are expected.

Figures for July and August production have just been issued by the Japan Cement Association. They follow:

	August	July
	—(In barrels)—	
Production	1,587,000	1,549,000
Forwarded	1,576,000	1,531,000
New contracts	1,455,000	1,113,000
Including:		
Exports	96,000	160,000
Domestic	1,359,000	953,000
Unfilled orders	6,682,000	6,290,000
Including:		
Exports	358,000	443,000
Domestic	6,324,000	5,847,000
Stocks	650,000	640,000
Stocks in clinker	250,000	271,000

Power Plant and Kiln Design and Operation

A Series of Articles on the Combined Processes of Power Plant and Kiln Operation Considered As a Unit

By R. R. COGHLAN
Chemical Engineer
AND
T. H. ARNOLD
Electrical Engineer, Southwestern Portland Cement Company, Osborn, Ohio

Chapter VI—Significance of Kiln Exit Gas Analysis

Composition of Kiln Exit Gases—Perfect Combustion Conditions—Excess Air—Coal Analysis and Weight of Products of Combustion—Draft Regulation—Application of Charts

THE analysis of the kiln exit gases is very important and the proper interpretation of these analyses will enable the operator to reduce the fuel consumption per barrel and increase the output per kiln hour to the maximum.

A high CO_2 content in itself means very little. Taken in conjunction with the other factors, the gas analysis is the safest guide to follow. Thus an analysis showing 28 per cent by volume CO_2 may indicate excellent operation in a dry process kiln with a certain raw mixture and a particular class of coal, and indifferent operation with another raw mix and coal, while this result could hardly be maintained with a wet process kiln.

The exit gases from a rotary kiln contain 3 constituent gases. The products of combustion of the fuel are mixed with the carbon dioxide in passing through the calcining zone, and in the case of the wet process kilns the moisture from the slurry is added as the gases pass through the drying zone. The customary gas analysis does not include the moisture. Thus the percentage by volume of the constituent dry gases are usually considered. These results are readily obtained by means of the Orsat Apparatus. As the relationships in the following discussion are in terms of weight it will be necessary to convert the analysis by volume to analysis by weight.

Composition of Kiln Gases

The main constituents of the dry kiln exit gases are carbon dioxide and nitrogen with small percentages of oxygen, sulfur dioxide, and carbon monoxide. In all probability the greater portion of the sulfur dioxide, in the presence of lime dust is converted to calcium sulphate, releasing a corresponding amount of carbon dioxide. This is corroborated by the deposit which is found in practically all hot gas flues in cement mills. The analysis corresponds with the mineral Glauberite which is anhydrous calcium sodium sulphate in the proportion of one molecule of each. For all practical purposes we may thus assume all the sulfur dioxide as carbon dioxide.

From a practical standpoint the difficulty incident to maintaining the necessary high flame temperatures with a deficiency of air result in ordinary operation with a surplus of air. The tendency is to carry a very considerable surplus of air. We may thus assume that the normal cement kiln dry gas will contain carbon dioxide, oxygen, and nitrogen in rather definite quantities. The proportions will vary from the gases of combustion in proportion to the percentage of carbon dioxide in the raw material and to the ratio of the weight of fuel to the weight of dry raw material.

This may be readily demonstrated. If we assume electric furnace conditions with no fuel and only the gases from the raw material we would have $CO_2 + SO_2 = 100$ per cent. If on the other hand, we assume an infinitely large quantity of fuel in proportion to the raw material, the gas analysis with perfect combustion would approach the value for the perfect combustion of the fuel in question. Plotting the CO_2 per cent by weight in the gases against the ratio, coal weight over raw material weight, we have a curve similar to A in Chart No. 1, varying between the limits of 100 per cent CO_2 with ratio $= 0$ and the theoretical value for the combustion of the fuel with ratio $=$ infinity.

This relationship may be mathematically expressed as follows:

$$x = \frac{a + by}{a + by + cy}$$

from which may be derived,

$$y = \frac{a(1 - \mathrm{x})}{x\,(b + c) - b}$$

Where $x =$ per cent CO_2 by weight in the exit gases with perfect combustion

$$y = \text{ratio} = \frac{\text{weight of coal}}{\text{weight of dry raw material}}.$$

$a =$ pounds of CO_2 per pound of dry raw mix.
$b =$ pounds of CO_2 per pound of coal burned.
$c =$ pounds of N_2 per pound of coal burned.

Excess Air

In practice the gases will rarely show perfect combustion. Conditions necessary to produce a deficiency of oxygen are too difficult to maintain with proper burning of the clinker to be common practice. The resulting secondary

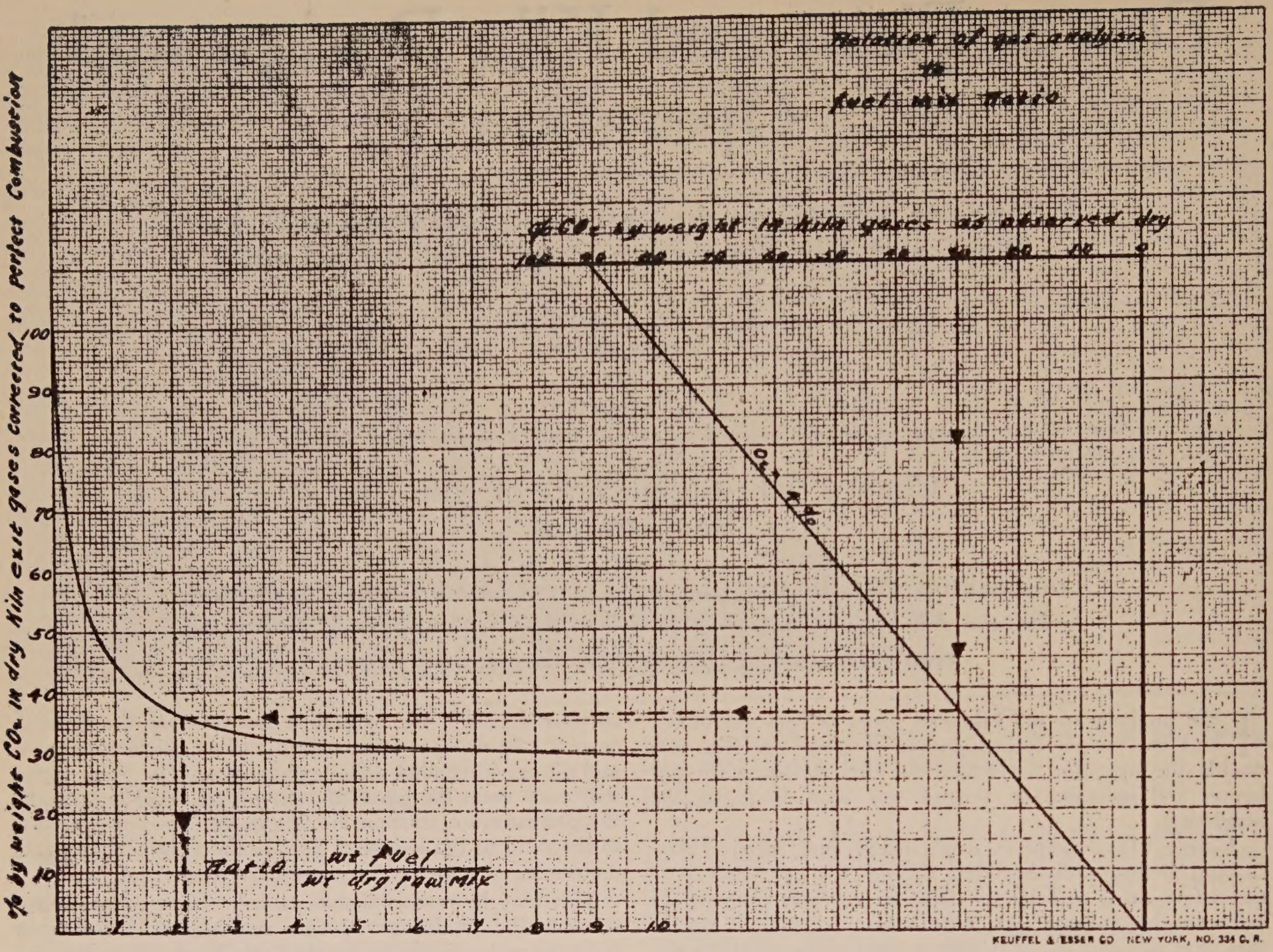


Chart No. 1

combustion in the flues will also be undesirable. Thus the average gases from cement kilns will show an excess of oxygen. If carbon monoxide is present, it will be necessary to recalculate it to carbon dioxide for the purpose of these charts. In order to eliminate the excess air from the gases it is necessary to eliminate the oxygen and the proportionate amount of nitrogen and recalculate the percentages of the constituent gases remaining. The conversion of the analysis is accomplished as follows:

$$x = \frac{f}{f + \left(h - \frac{.769\,g}{.231}\right)} = \frac{f}{f + h - 3.39\,g}$$

but $h = 100 - f - g$
substituting for h

$$x = \frac{f}{f + (100 - f - g) - 3.39\,g} = \frac{f}{100 - 4.39\,g}$$

Where x = per cent CO_2 by weight in the exit gases with perfect combustion.
f = per cent CO_2 by weight in the exit gases as observed.
g = per cent O_2 by weight in the exit gases as observed.
h = per cent N_2 by weight in the exit gases as observed.

This is the expression of a series of straight lines radiating from zero as shown in Chart No. 2. This chart may be applied to any gas analysis as the relationship is general. These lines may be applied to the curve shown in Chart No. 1 in order to convert directly from the observed analysis by weight to the ratio of fuel to raw material. Thus starting with an assumed observed analysis of 30 per cent CO_2 and 4 per cent O_2, we would enter the chart at 30 per cent CO_2 in the upper scale of observed per cent of carbon dioxide and pass down to the intersection with the diagonal marked 4 per cent O_2 which gives the value of 36 per cent on the horizontal scale. Proceeding horizontally to the intersection with the curve we find the ratio .20 which will be the ratio of the weight of fuel to the weight of dry raw material with the conditions as shown. A considerable portion of the curve is shown in Chart No. 1 but the actual range covered in the actual operating practice will be covered by the range of ratio = .10 to ratio = .35.

The weight of the products of combustion will vary widely with the variation in the composition of the fuel. The values for coal will vary materially from those for oil or gas, and the values for the different classes of coal will show considerable divergence as the ratio of fuel increases.

The analysis of the raw material will also affect the form of the curve. Thus it will be necessary to plot these curves for the raw material and fuel used in any particular plant and the results shown on the charts accompanying this article may not be applied to a particular plant except as a general indication of the tendencies. A careful determination of the carbon dioxide in the raw mix and an ultimate analysis of the coal as fired will be necessary. The ultimate analysis of the coal may be reduced to an ash-free basis, and from this basic coal the analysis of subsequent samples may be obtained by correction for the ash content and moisture. This will apply so long as the coal is furnished from one seam.

Coal Analysis

To illustrate this point the results have been calculated for a wide range of representative coals. The average ultimate analysis of the coals in question were as follows in Table No. 1.

TABLE NO. 1

Average Ultimate Analysis of Coal. Per Cent by Weight

Coal No.	Carbon	Hydrogen	Nitrogen	Oxygen	Sulfur	Ash
1	90.66	1.93	——	.78	——	6.83
2	83.20	3.29	.95	2.45	.50	9.61
3	85.46	3.72	1.12	3.45	.91	5.34
4	80.32	4.88	1.46	4.69	1.00	7.65
5	77.82	4.89	1.48	6.52	.90	8.39
6	77.37	5.43	1.83	9.76	1.22	4.39
7	54.59	5.49	1.11	21.52	4.01	13.28
8	63.61	5.82	1.03	22.22	.63	6.99
9	54.91	6.39	1.02	32.59	.59	4.50

The weight of the various products of combustion per pound of coal burned for each of these coals is given in Table No. 2.

TABLE NO. 2

Weight of Products of Combustion in Pounds Per Pound of Coal

	Coal No. 1	2	3	4	5	6	7	8	9
Carbon dioxide	3.32	3.05	3.13	2.95	2.97	2.84	2.00	2.32	2.01
Water	.13	.27	.33	.44	.44	.49	.49	.52	.58
Nitrogen	8.37	8.19	8.51	8.32	8.39	8.01	6.00	6.47	5.52
Sulfur dioxide	——	.01	.02	.02	.02	.02	.08	.01	.01
Ash	.07	.10	.05	.08	.08	.04	.13	.07	.05
Total weight of gas	11.82	11.52	11.99	11.73	11.81	11.38	9.58	9.33	8.01
O_2 from air	2.52	2.46	2.55	2.49	2.52	2.41	1.71	1.94	1.66
N_2 from air	8.37	8.18	8.49	8.31	8.37	8.00	5.89	6.47	5.52
Total weight of air	10.91	10.67	11.05	10.80	10.90	10.42	7.40	8.40	7.19

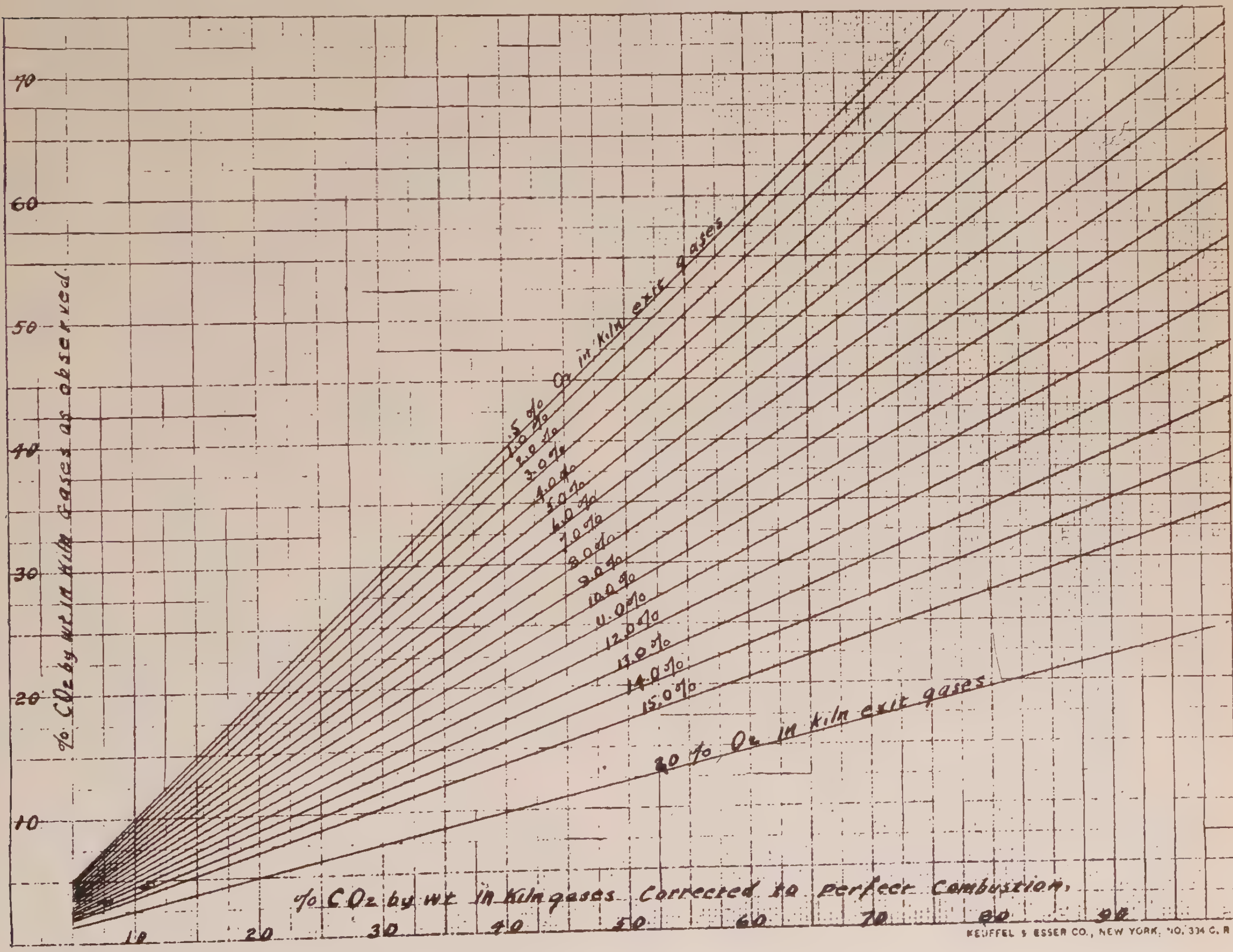


Chart No. 2

The variation in the gas percentages of these coals has been plotted on Chart No. 3 with varying ratios of fuel weight to raw material weight. These have all been plotted with a given raw material analysis in order to show all the variation in the fuel.

Obviously with the wide variation in the weights of the constituent gases the total volume of the gases throughout the kilns and boilers will give radically different burning conditions and the necessary drafts to produce efficient operation will vary considerably. The amount of air required is radically different; thus the fan burners and air piping must be different in color in order to maintain the proper velocities.

As previously stated these charts may not be applied directly to any plant conditions but are furnished to illustrate the variation to be expected. A set of these curves prepared to fit the coal and mix combinations for a particular plant will be quite valuable in tracing combustion conditions in that particular plant. The accuracy of this has been checked in a practical way for a period of a month. Careful coal and material weights were kept and analyses made of the kiln exit gases at frequent intervals throughout the twenty-four hours for the period. The results were well within the errors of observation.

If it were practically possible to maintain an absolutely constant amount of raw feed and coal feed to the kiln with a constant air supply, and we could insure the uniform passage of the material through the kiln, then we could maintain any desired position on the curve which will give the necessary heat balance for proper burning of the clinker. This statement will probably meet with protest from the operator, but the more nearly this condition is approached the more nearly the maximum output of the kiln is approached. If the operations are carefully watched it becomes apparent that the rates of feeding are subject to considerable momentary variation.

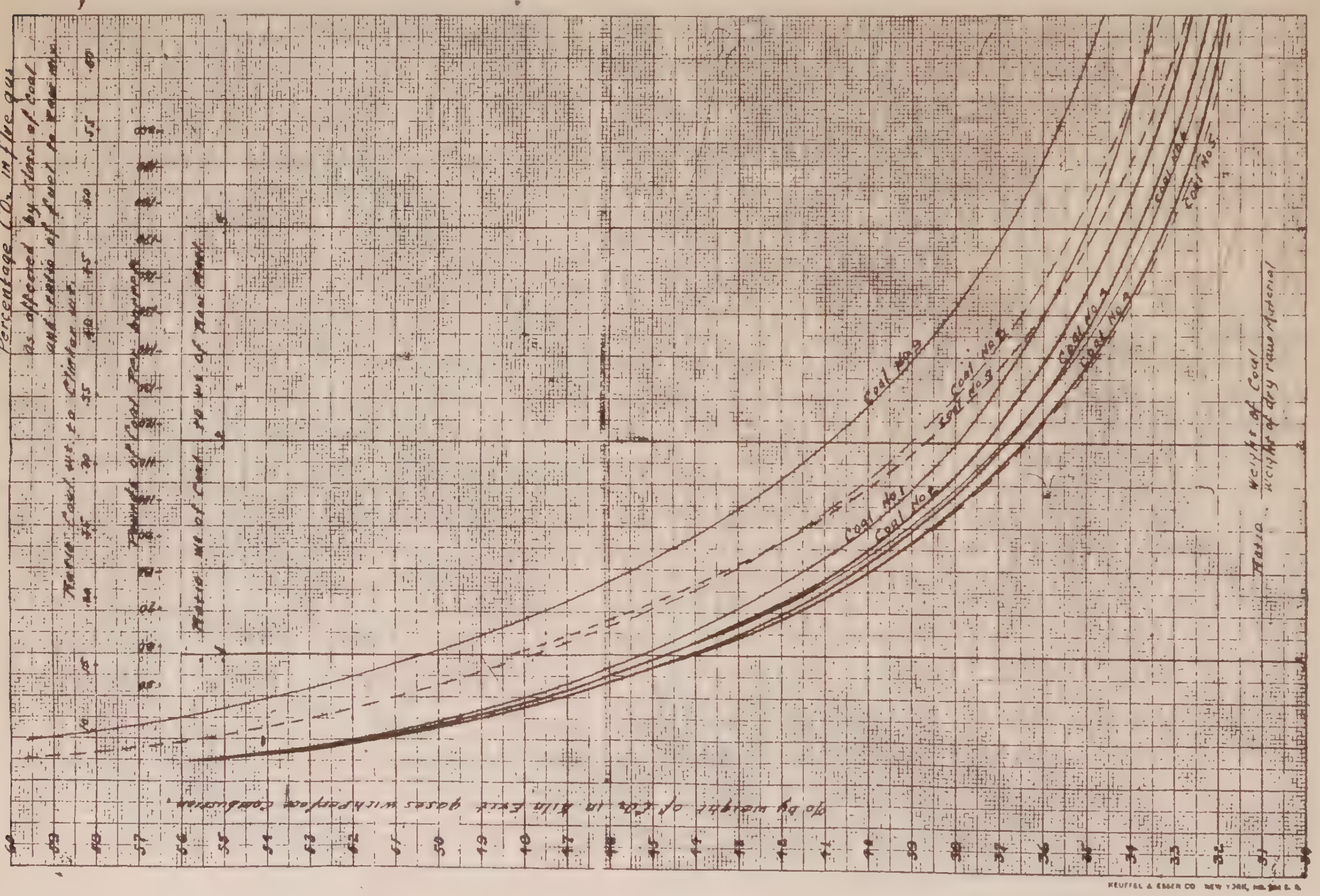


Chart No. 3

Frequent Analyses Desirable

The customary velocity of the gases in the various parts of the kiln will vary from 20 to 80 feet per second. It is evident that a few isolated gas analyses have very little actual value. A large number of analyses at frequent intervals are thus necessary to correctly determine the actual conditions existing and to apply corrective measures. In other words, the Orsat must be removed as an ornament of the chemical laboratory and made a practical working tool of the cement burner and the boiler operator.

The wide and rapid fluctuation in the gas analyses with apparently uniform conditions becomes very apparent when such studies are made. The investigation of the causes for these variations will lead to many points which at first glance would appear to have little effect upon the gas analysis. The formation of a mud ring will have the effect of reducing the carbon dioxide in the gases. When such a ring breaks and the material passes down the kiln, the proportion of raw material to fuel is again upset and the percentage of carbon dioxide becomes abnormally high in the gases. The mechanical imperfections of the feeding mechanism will give fluctuations which are at times very apparent. These fluctuations may be further complicated by variations in the chemical analysis of the raw material as fed or in the water content of the slurry. The quantity of fuel must be adjusted to meet the maximum conditions of carbon dioxide in the raw material and water in the slurry. Whenever the coal rate is changed the amount of air must be changed accordingly.

Fluctuations are thus largely due to mechanical imperfections in the equipment which further development of the apparatus will gradually eliminate. The effect of these fluctuations is not only observed in the lowered output and higher fuel consumption but is most prominent in the variation in the quality of the clinker burned. It is highly essential that any mill produce an absolutely uniform product in order to retain its market. It is desirable that the quality be as high as possible and uniformity is the primary requisite of quality.

The variation in the gas analysis resulting from the combustion of the various classes of coals indicates a considerable variation in the volume of the gases leaving the kilns.

Chart No. 3 has been prepared to illustrate the variation in the volume of gas per barrel of cement with different ratios of fuel to raw mix for several of the coals mentioned. It is obvious that for any particular slurry the volume of the water vapor and carbon dioxide will be constant. Any variation in these factors will result in a shifting of the values of the volume of gas per barrel. The proportion of the gases from the mix to the gases from combustion will vary widely with the fuel ratio and the characteristics of the fuel used.

A careful study of plant conditions based on the points covered by these charts cannot fail to result in increased fuel efficiency, better heat recovery and lowered production cost with increased output of the kilns.

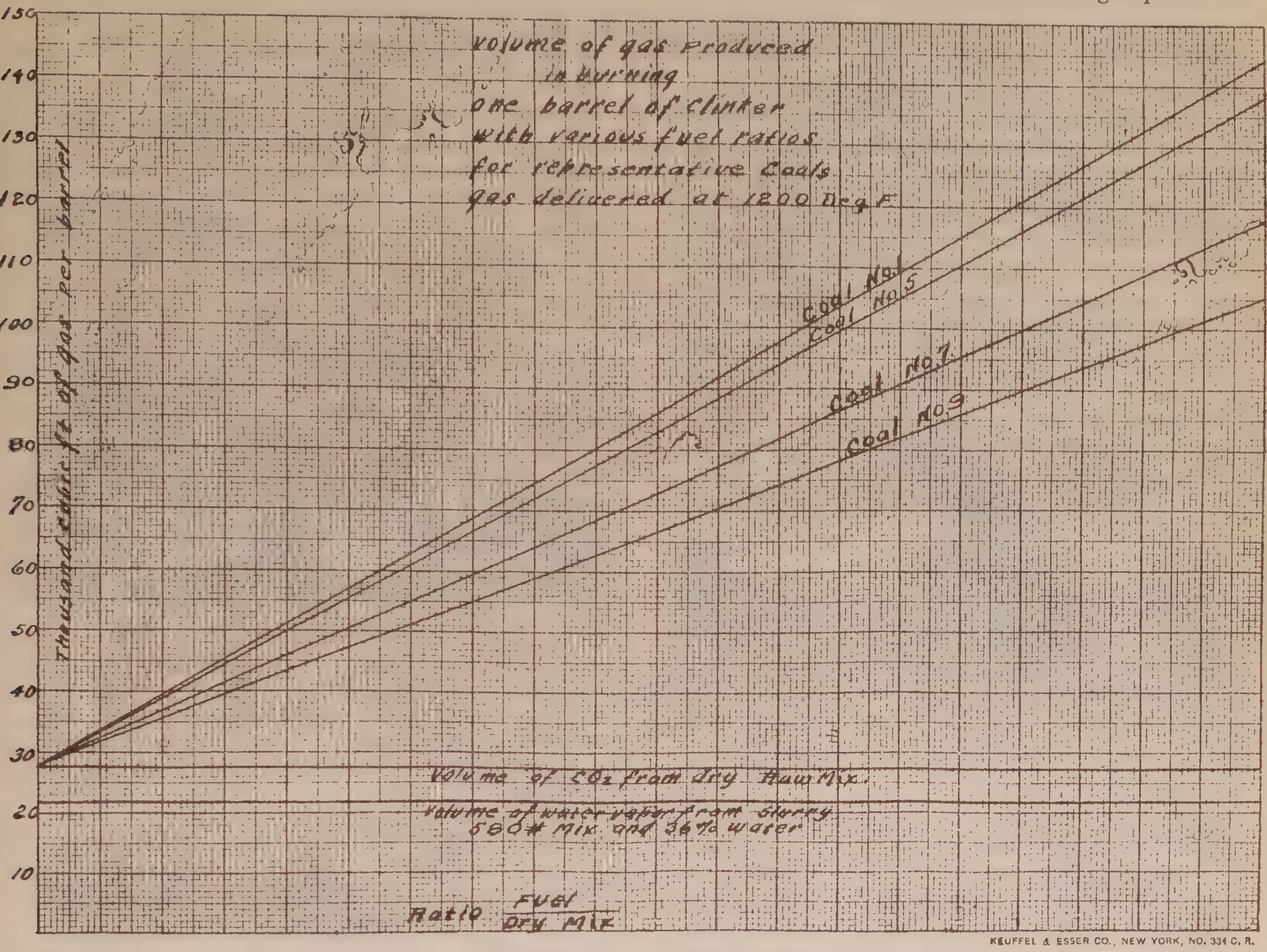


Chart No. 4

Lime Subject of Symposium at Chemical Society Meeting

The increasing importance of lime in industry has awakened the interest of scientific men of the country and as a result a symposium on lime has been included in the program of the American Chemical Society for its Spring Meeting at Richmond, Va., April 11 to 16.

Three half-day sessions will be devoted to the technical problems in the production and use of this material.

The following recognized authorities in their various lines are included in the list of speakers: P. A. Paulson, Kimberly Clark Paper Co.; Chas. Warner, Chas. Warner Co.; J. M. Dorr, The Dorr Company; A. H. Hooker, Hooker Electrochemical Co.; Professor G. I. McLaughlin, University of Cincinnati; C. P. Hoover, Columbus, Ohio, Water Purification Works; L. F. Warrick, Wisconsin State Board of Health; W. E. Carson, Riverton Lime Co.; Professor G. L. Clark, Massachusetts Institute of Technology; V. J. Azbe, Consulting Combustion Engineer; Professor O. R. Overman, University of Illinois; R. K. Meade, Consulting Engineer.

German Asbestos Sales Company

Washington, D. C.—German producers of asbestos cement, headed by Koch & Kienzle, of Berlin, have formed an asbestos cement utilization and sales company (Asbestzement Verwertungs-und Vertriebs G. M. B. H.) with headquarters at Berlin, reports Trade Commissioner W. T. Daugherty of the Department of Commerce. The company intends to promote the use of asbestos cement products of all kinds and to acquire in Germany and abroad patents applying to its production.

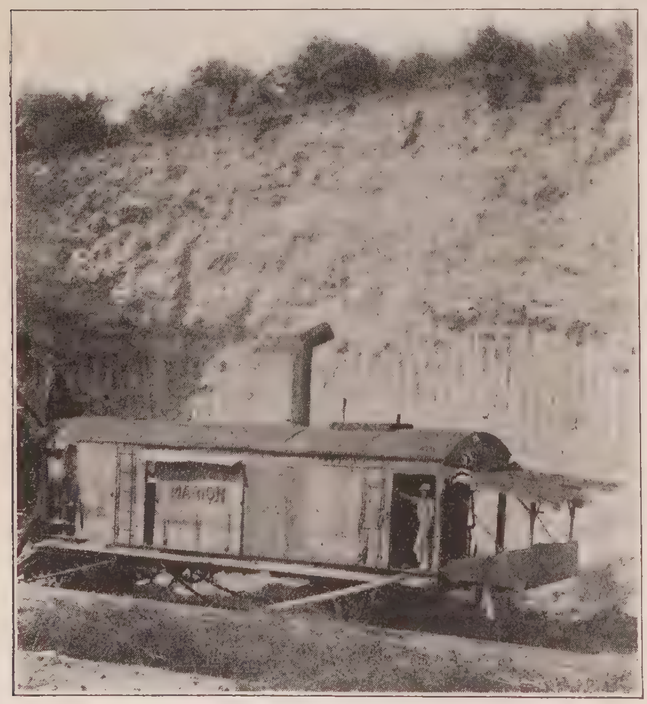
Philippine Government Quits Cement Business

By GEORGE BALLARD BOWERS

THE Philippine government placed its participation in the cement business among the official experiences of the past when its portland cement plant was sold to a concern headed by an American for 2,175,000 pesos, or approximately $1,087,500, the purchaser to assume a bank overdraft of 475,000 pesos, or about $237,500 more. The government plant had been opened in 1922 at Naga, Cebu. Adjacent to the plant were found great quantities of raw materials required except gypsum which was obtained at other points in the Islands. The available raw materials sold with the plant cover one hundred twenty-five acres.

Storage yard, served by overhead crane and clamshell bucket

The plant is a modern wet process plant in which a second kiln may be installed without adding materially to the operation costs. The present capacity is twelve hundred barrels daily. The new owners will effect great economies principally through the use of coal from the American-owned mines within the sight of the plant.



Steam shovel operating in the quarry

The question naturally arises as to why the government-owned plant had not used coal from the American-owned mine instead of imported Japanese. The explanation is in the term "American-owned"; the Americans were unable to placate the Filipino politicians responsible for the great losses recouped by bond flotation in the United States, guaranteed by American sovereignty.

General view of the Cebu cement plant

The Uling Coal Company, an American-owned concern, in October, 1924, contracted to supply coal to the government-owned plant at nine pesos or $4.50 per ton. A Filipino manager was appointed soon after, in November of the same year. It is said that he boasted that he would break the coal contract with the Americans so that they would be willing to sell their mine at a low price. The contract was broken. During the two years following, the government plant bought Japanese coal at fourteen pesos, consuming during that time fifty thousand tons, paying out two hundred fifty thousand pesos in its effort to break the American coal company which has since sought damages.

Another view of the plant

With proper management, Naga cement should cost approximately one and one-half pesos per barrel, the necessary iron-containers may be turned out at one peso each, the cement and container costing two and one-half pesos or one dollar and twenty-five cents. At this cost, the plant should be highly profitable in view of the great demand in the Islands and the China Coast.

For the first time in seventeen years, the American Society of Mechanical Engineers will hold a meeting of national scope at a well-known resort. This will be the 1927 Spring meeting, to be held at White Sulphur Springs, W. Va., May 23-26.

The Cement Industry of Poland

A History of the Cement Industry in Poland—Its Problems—Its Manufacturing Capacity—Its Domestic and Foreign Markets and Its Future Development

By A. C. BLACKALL

POLAND was one of the first countries in Continental Europe to begin the manufacture of cement, the first Polish factory being opened at Grodziec in 1858—69 years ago. This was only the third factory on the Continent. It was not long before other works were established at Wysoka and Podgorze. A little later still, in the triangle formed by the towns of Cieszyn, Krakow, and Czestochowa, which were at that time under two different governments, nine factories were erected. This latter development was due to the discovery of formations of Jura lime in the district and the close proximity of the famous Krakow and Dabrowa coal fields. The Ros, Wolyn and Firley cement plants were also established on the right bank of the Vistula. There is also a small factory at Wejherow in what was formerly Prussian Poland. This factory caters to the neighboring district of Pomerania.

Production Capacity

At the commencement of the War, the combined production capacity of all these factories, which, by virtue of the Treaty of Versailles, are now on the territory of the Polish Republic, was about 950,000 metric tons. During the War three of the plants located east of the Vistula were partly destroyed. Two of them—the Firley and Ros works—were reconstructed, the former restarting operations in 1925 and the latter two years earlier. The third, however, the Wolyn works at Zdolbunowo, has not yet been rebuilt, for the reason that its markets were the governments of Podolia and Kijow in the southeast areas, which now belong to the Russian Soviet Republic.

The capacity of the Polish cement industry shows an extraordinary increase in output between 1910 and 1914, a decline caused by the War in 1919 and 1920, and finally a gradual recovery since 1920. The present annual production capacity of the Polish industry (excluding the Wolyn works) amounts to 1,200,000 metric tons. The following are the leading factories today:

Factory	*Furnace*
Firley	Rotary
Grodziec	Rotary
Goleszow	Rotary
Gorka	Rotary
Klucze	Ordinary Shaft
Lazy	Automatic Shaft
Ogrodzieniec	Ordinary Shaft
Podgorze-Bonarka	Rotary
Ros	Rotary
Rudniki	Rotary
Szczakowa	Rotary
Wejerow	Rotary
Wick	Rotary
Wrzosowa	Ordinary Shaft
Wysoka	Rotary
Wolyn	Rotary (Closed)

The raw materials used are limestone and clay (72 per cent), marls resembling natural cement (18 per cent), and chalk and clay (10 per cent).

Market Analysis

In 1925, Poland's consumption of cement per capita was 16 kilograms, in comparison with 70 kilograms in Germany, 80 in the Scandinavian countries, and 220 in the United States. The reason for Poland's exceptionally low figure is quite comprehensible when the position of each of the three principal users of cement during the last few years is considered. These three consumers are as follows: (1) State and municipal authorities, who are responsible for public works; (2) Large industries, principally mines; and (3) Private consumers, 75 per cent being agriculturists. During the period of inflation that followed the War (1920-24) Poland was unable to undertake public works, such as the construction of canals, roads, etc., on a large scale, as she had to protect herself against any evil effects resulting from the fall of the mark. Then, in 1924, came Grabski's currency reform and the introduction of the zloty, which necessitated the withholding of all credits for such purposes. Public works of every description were reduced to a minimum and the consumption of cement naturally declined in proportion.

The Polish cement industry passed through an acute crisis as the result of the currency reform. Consumption fell by 50 per cent, especially in the coal industry, which normally uses as much as 1,500,000 tons per annum. Building operations, particularly by agriculturists, practically ceased, owing to the scarcity of ready money caused by deflation and high taxation, and in Eastern Poland the damages caused by the War were repaired almost exclusively with local lumber. Foreign capitalists stood aloof, watching the results of the currency reform.

Signs of improvement can be observed today in all the three provinces of the republic. Partly with the object of abolishing the unemployment resulting from the industrial crisis, the government started a number of important works. For this purpose, the aid of foreign capital was in some cases enlisted. First and foremost, the construction of the port of Glydnia is being continued with intensified activity. In addition to the building of new railroads, the preliminary work is in progress for the construction of a large canal to link up the coal fields with Warsaw and the sea. The Transit Committee of the League of Nations recently sent a commission of experts to Warsaw in connection with this scheme. Also, the satisfactory harvests of the past two years have enabled Polish agriculturists to undertake some essential improvements, and foreign capital has commenced to play an active part in the country's development.

Foreign Markets

For the time being, however—during 1927, at any rate—all these schemes can have but a slight effect on the cement industry. It has, therefore, concentrated its attention on export markets, in which the possession of a product of superior quality, which can be sold at a competitive price due to the comparatively low price of fuel and labor, gives it remarkable advantages. On the other hand, it has certain difficulties to contend with, owing to Poland's remote geographical position.

Polish cement is of superior quality. It sets fairly quickly at first and hardens rapidly. There is not a cement factory in Poland today which does not produce cement up to the standard specification of 1925 laid down by the British Engineering Standards Association, while approximately 75 per cent of the total output is cement of such superior quality that a mixture of one part of cement to three parts of sand gives, after 28 days, a tensile stress of 450 pounds per square inch and a compressive strength of 7,000 pounds per square inch. Some of the factories manufacture cement which actually gives results exceeding these figures by more than 40 per cent.

Four of the Polish cement plants—Goleszow, Szczakowa, Ros and Wolyn—prior to the war had permanent markets in Austria, and in the provinces of former Russia, but as a result of changed customs and transport relations exports have dwindled since 1924. Moreover, the territories east of Poland are as yet economically undeveloped and have not yet reached the stage when intensive building operations are essential. Consequently, they do not at present constitute a potential export market for her cement.

Gdansk is the port for the cement plants located in the Dabrowa and Krakow basins, from which unfortunately it is 400 miles distant. Consequently, before shipment, the cement must be sent this long distance by rail, be unloaded and warehoused at Gdansk, where the port duties are very high, and can only be exported to one of the few countries which has a direct shipping service with Gdansk. The cost of transshipment at Hamburg, Rotterdam, or Antwerp would make all competition with other countries absolutely impossible.

Contrast these difficulties with the advantages of the Scandinavian, Belgian, and German factories, which are either located near the seaboard or the banks of waterways, and are served by direct shipping lines to nearly all parts of the globe—all the vessels on the Hamburg-South American line which import Chilean saltpetre and other bulk goods take cement back as ballast—it is easy to appreciate why Polish cement is so little known on the world's markets notwithstanding its superior quality and comparatively low price.

Export Conditions Improved

In 1925, however, a considerable improvement was effected in this respect. Realizing that the export of cement—the manufacture of which depends solely upon raw materials obtained in the country—would have a most favorable influence on the trade balance of Poland, and that an increased consumption of small coal by the cement factories would also increase the exporting capacity of the collieries, the Polish government reduced the railway rates on the transport of cement to Gdansk and other frontier towns by 50 per cent, thereby reducing very considerably the handicap from which the Polish export cement trade suffered. The development of Gdansk and the construction of a port at Gdynia have greatly increased the number of shipping lines connecting Poland with the Near East, the Scandinavian countries, etc. As a consequence, during the present year, fairly large quantities of Polish cement have found their way to Palestine, Turkey, and Sweden.

Work has also been started on a railway line from Upper Silesia to Gdynia and Gdansk, which will shorten the route by 60 miles, and, as before mentioned, a scheme—which has every prospect of being carried out very soon—for the construction of a large canal linking up the coal basins with the sea, has been prepared. These two developments will still further aid the Polish cement industry in its efforts to secure for itself a strong position in the markets of the world.

With the development of Poland's natural resources, which must continue if the country's prosperity is to increase, much constructional work will be needed, and the making of canals, railway lines, etc., will steadily improve the position of the cement manufacturing industry. Once the works are able to produce to capacity and make proper use of their up-to-date plant, the industry will undoubtedly become one of the staple industries of this very progressive new republic.

It is the chief object of the leaders of the Polish cement industry to keep the equipment of the works thoroughly up-to-date, and the importance of quality production is fully realized. As a large number of the plants were constructed between 1912 and 1913 and some were reconstructed between 1920 and 1925 it can safely be asserted that more than one-half of Poland's total output is produced by plants installed after 1912. The high percentage of rotary furnaces indicated in the above table is an indication of the industry's modern equipment.

U. S. Reports on Manufacture and Use of Cement in Argentina

Washington, D. C.—The use of portland cement has greatly increased in Argentina during the past five years. Both imports and domestic production have shown successive increases from year to year. Assistant Trade Commissioner S. H. Avery, at Buenos Aires, reports to the Department of Commerce that the country now has three cement manufacturing plants and that receipts of foreign cement increased from 163,000 metric tons in 1921 to 371,000 in 1925 and, according to an unofficial estimate, to 186,520 tons during the first six months of 1926. Belgium has consistently held the lead in supplying the Argentine market for portland cement, with Denmark, Germany and Norway furnishing large amounts.

Although the United States has only a small share of the import trade, the manufacture of cement in Argentina by an American company is the outstanding factor in the cement trade of the country. The American plant is the most important of the three mills now operating, and has an annual capacity of 735,000 barrels, compared with 70,000 barrels from one of the other plants and 35,000 from the third. The entire consumption of portland cement in Argentina in 1924 was approximately 413,000 metric tons, of which 138,715 tons, approximately one-third, was manufactured locally; 128,715 by the American company. In 1925, the domestic output supplied only about one-fourth of the total consumption of 500,000 tons, 119,000 tons being furnished by the American company.

Total production of the domestic industry last year is estimated at 165,000 tons, the highest on record. Consumption during the first half of the year amounted to 268,135 tons, of which 81,615 was of domestic manufacture, including 76,615 tons produced by the American company. Argentine imports of cement last year have not been reported but it appears that approximately 70 per cent of consumption was imported.

Engineer Reports on State-Owned Michigan Plant

C. H. Sonntag, Engineer, Makes Survey of Equipment, Buildings and Labor at State-Owned Plant; Reports Much Out-of-Date Machinery

AT the request of Governor Fred W. Green of Michigan, Mr. C. H. Sonntag, Missouri engineer, has investigated the state cement plant at Chelsea to determine the physical assets and liabilities.

The report presented to Governor Green reads in brief as follows: "The land is of no value for agricultural purposes, apparently contains no marl and is partly covered by water. The land is now carried on the books as an asset valued at $120,000, or an approximate value of $170 per acre. Clay has now been removed from a considerable area which is now covered by water and a depletion charge of $50 per acre should be assessed against this land at once.

"The books at the mill show that gypsum is received from two producers at a uniform price of $2.50 per ton plus freight. This price seems a little high.

Rock Charges

"Rock is costing 60 cents a ton of 2,000 pounds, f.o.b. cars, Detroit district, plus a freight charge of 60 cents a ton, making the rock cost $1.20 a ton at the mill. Since this mill uses 407 pounds of rock to make a barrel of cement, this indicates a penalty of 12 cents a barrel because there is no source of cheap lime near the plant.

"Coal comes to the plant from various sources and most of it is tested for ash or sulphur and heating value in the laboratory. There does not seem to be any coordination between the laboratory and the purchasing department.

"The boilers have the low settings close to the grate that were customary 15 years ago. They have no stokers and are hand-fired. The stack is not high enough nor large enough in diameter to give a good draught; the engines are the most inefficient type, with one exception, that could be bought. There is some talk around the plant that these engines were not new when installed."

Power Plant Insufficient

Mr. Sonntag continues: "The entire power plant is inadequate to operate the mill or more than half of it. It did not present good practice even when built, and it would use twice as much coal to produce a kilowatt hour as would be needed in a modern plant. The engine and boiler rooms have brick walls with wooden roofs. This whole power plant is carried on the books at a valuation that is absurd, for it is totally and completely obsolete and its value, except the boilers, is that of its weight in junk only. It is recommended that the value of the bare boilers be taken at not over $6,000 because of their age."

Of the raw grinding machinery, Mr. Sonntag says: "This consists of two kominuters and three tube mills. One of the former was permitted to run with a cracked shaft until it was practically wrecked. The kiln room is also entirely obsolete. All the kilns discharge their gas into a common flue leading to a concrete stack."

"As a means of correcting the composition of the slurry, the slurry tables are of very little value, for they are not fitted with proper agitators. The laboratory records show variations of as much as 2½ per cent in the lime content."

The report continues, "The concrete stack is in a failing condition and an outer concrete jacket was put on it last summer, but the job was not completed. It would cost $30,000 to put this kiln room into good condition."

Coal Mill Obsolete

The report states that the type of coal mill has been discarded by everyone who has used it; that the motors driving them are twice as large as necessary; and that the entire mill is a positive menace and in constant danger of explosion.

It is said that all of the clinker grinding machines are out of date and some of them should be junked, together with the tube mills.

The labor situation at the plant is criticized severely. Mr. Sonntag insists that too many men are employed, with numerous men as foremen who ought to be actual operators, as the mill is not large enough to require department foremen.

The report charges that a pernicious bonus system is employed which increases the basic pay about 30 per cent, "besides introducing other evils," and that there seems to be an unwritten law that the men shall earn a minimum annual salary, adding that the kilns are forced to do about 800 barrels a day, at least 100 barrels more than their capacity. Mr. Sonntag says that cement in the bins has been costing about 40 cents a barrel more than in modern plants.

Conclusions

The report concludes with these statements:

"When the plant was leased by the state it was not, in fact, a commercially successful concern, as evidenced by its rapidly increasing indebtedness and the obsolescence of the equipment and depletion of the marl deposit.

"The state was not justified in taking control of this plant and purchasing it, for it did not get actual value in exchange.

"Operation under state control has been contrary to the best interests of the public roads and other public construction, for quantity of produce has been forced at the expense of quality.

"State operation has been wasteful, for costs have been excessive as compared to those in private plants.

"The state is not justified in continuing operation of this plant, unless it can be shown that it can use the entire output and save a considerable sum by doing so as compared to the purchase of its cement requirements on the open market. In doing this, the entire instrument in fixed assets should be written off in a very few years, say four, and the same accounting methods that are used in privately owned plants should be adopted."

MEN and MILLS

Notes from the Field

Louisiana Makes Plans for $500,000 Transportation System

International Subsidiary Plans Marine Line from Alabama City to Plant

The Louisiana Portland Cement Company will spend a half million dollars in developing South Alabama cement rock and a transportation system between St. Stephens Bluff, Oven Bluff, Mobile and New Orleans, according to Lewis R. Ferguson, manager for the company with headquarters at New Orleans, La. This company has purchased several hundred acres of land 70 miles north of Mobile, Ala., for exploitation.

A fleet of boats will be constructed within a short time to operate on the Mobile and Tombigbee rivers, between Oven Bluff and New Orleans. The first unit of the fleet, according to Mr. Ferguson, will comprise six barges of 1,200 tons' capacity each and a Diesel propelled tow-boat. The tow-boat will cost $100,000 and the barges $22,000 each.

The St. Stephens, Ala., site was made after a careful survey of available cement lands. It is understood that when the International Portland Cement Company selected New Orleans as a site for its Gulf subsidiary it had planned to utilize what was supposed to be vast deposits of oyster shells in Louisiana waters. These deposits have been exhausted because of the tremendous scale upon which operations have been conducted, and as a result the company was faced with the need of cement rock.

Early movements, it is estimated, will run to 12,000 to 12,500 tons of cement rock monthly, with a later increase to 25,000 tons monthly. The plans are designed, it is understood, to forestall foreign competition in the Gulf States. British and Belgian concerns have laid down cement in the Gulf ports at prices cheaper than American manufacturers, and it is to block this competition that the plant was established at New Orleans.

Machinery for the first units of the crusher plants will be sent to St. Stephens shortly. The company will ship 1,000 tons of coal monthly from near Cordova, Ala., to the plant at St. Stephens Bluff and Oven Bluff. From 75 to 100 men will be employed permanently at the crusher and extraction plants.

It is understood that the leases on the property given the Louisiana Portland Cement Company control all the available cement rock deposits in South Alabama.

Another Mill for Pennsylvania, at Florin

Florin, Pennsylvania, is soon to have one of the largest cement manufacturing plants in the vicinity. As weather permits, construction will be begun on what was formerly the Bennett farms west of Florin and recently purchased by the Barnes Company of Philadelphia.

Lime and Stone Company to Erect Own Cement Plant

The Standard Lime and Stone Co., at Baltimore, Maryland, is reported soon to be erecting a cement plant in connection with its present operations. Daily capacity will be 1000 barrels.

State Cement Plant for Arizona Brought Up

Appropriation of $250,000 for establishment of a state cement plant which would use prison labor is asked in a bill introduced into the legislature of Arizona by Senator Tom S. Kimball of Graham County. The proposed plant would make possible construction of hundreds of miles of concrete highways at minimum cost as well as reduce the cost of new state building construction, the senator declared in asking for passage of the bill. All money derived from the sale of cement would be placed in a special fund created by the bill.

$10,000,000 Cement and Slag Company at Youngstown, Ohio

The Bessemer Limestone and Cement Co., the Standard Slag Company, the Buffalo Slag Company and the Federal Cement Company are included in a new company organized at Youngstown, Ohio. Capitalization is set at about $10,000,000.

Santa Rosa Property Sold to International

The Santa Rosa Cement Company, which was organized by C. L. Hall, to build a plant on the Tombigbee River, near St. Stephens, Alabama, has transferred the entire property to the International Cement Corporation.

This means that the plant, which was designed by The H. K. Ferguson Company, of Cleveland, Ohio, under the direction of W. H. Kewish, will not be built by them as contemplated by Mr. Hall, but that the International Company will hold the property for later development, as may be needed.

Lehigh to Tap Virgin Union Co. Hills

Options on farm land on the ridge above Miffinburg, Pa., have been taken by the Lehigh Cement Company, represented by Dr. A. D. Leh and Charles Reed, with the intention of blasting out tons of limestone rock. There is every reason to believe that the option will be exercised and work begun at an early date.

Maj. Weeks Retires; Succeeded by R. R. Caskey

At the annual meeting of the Signal Mountain Portland Cement Company, the retirement of Maj. H. J. Weeks, secretary and assistant manger, was assented to. He will be succeeded by R. R. Caskey. Maj. Weeks, who has been assistant manager for the past two years, is a retired officer of the United States Engineer Corps.

It is said that announcement was also made at the meeting that all negotiations for a consolidation of the Signal Mountain plant with the Hermitage Portland Cement Company of Nashville had been dropped.

Phoenix Birmingham Plant Goes into Operation

The new $2,500,000 plant of the Phoenix Portland Cement Company, at Powderly, near Birmingham, Ala., is completed and has commenced operation.

The wet process of manufacture will be used. A number of acres of lands surrounding and containing the finest of cement rock, is owned by the company. The plant is located a few miles out of Birmingham, Ala., and has ample railroad facilities. Buildings are of concrete.

A realistic rustic concrete fence surrounds the office of the San Antonio Portland Cement Company, at Cementville, Texas. Being colored in natural hues, even at close range, the work appears to be of wood.

Note the attractive office building and the safety trophy on the lawn.

Trinity Plant Construction Well Under Way

The machine shop has been virtually finished, and excavation work for other buildings is being pushed by the Trinity Portland Cement Company as part of its $2,000,000 plant building program, at Houston, Texas.

The machine shop is 40 x 227 feet, of concrete and steel. The clinker and shell storage building will be 100 feet wide, 20 feet high, 665 feet long. In addition, eight silos, each with a capacity of 140 bbls., are planned.

Equipment will include 8 x 40-foot grinding mills, and a kiln 11 by 300 feet. Starting capacity will be 1600 barrels per day.

Officers of the company are: W. H. L. McCourtie, president; C. E. Ulrickson, vice-president and general manager; and O. V. Bartholomew, general superintendent.

A permit has been issued for the erection of a $375,000 warehouse, 100 by 644 feet, one-story, of concrete and steel. This will provide storage for both raw and finished material, the grinding room separating the two divisions.

Lime Products Company Backing Proposed Plant

Surveys and estimates are being made for the establishment of a portland cement plant at White Cliffs, Little River County, Arkansas, contracted for by A. B. Banks, president of the Lime Products Company. The Lund Engineering Company is doing the preliminary work.

These activities are the outgrowth of the successful operation for several months of a whiting plant on the same property.

Carl Leonardt's Death Loss to Industry

The outstanding activity and energy of Carl Leonardt were stilled by death on Monday, February 14th, in Los Angeles, California. Mr. Leonardt was 71 years of age and had undergone a major operation a fortnight before.

For the past ten years Mr. Leonardt had devoted his time to cement manufacturing. He was president of the Southwestern Portland Cement Company, with plants at Dayton, Ohio; El Paso, Texas, and Victorville, California. It was the Ohio plant, opened in the middle of 1925 for the manufacture of "Miami" cement, that came closest to fulfilling Mr. Leonardt's idea of a model plant.

In his forty years' residence in Los Angeles, Mr. Leonard became well known also as a building contractor. He was responsible for the erection of the Pacific Electric Building, the H. W. Hellman Building, in which his offices were located, the Hall of Records, and sugar refining plants in neighboring towns.

Westphalia, Germany, was the place of Mr. Leonardt's nativity. He left there 41 years ago for America, remaining at San Antonio, Texas, for one year before becoming a resident of California.

Two daughters, Mrs. Felix McGinnis, San Francisco, and Mrs. F. H. Powell of Los Angeles, survive Mr. Leonardt.

Huron Awards Contract for Great Lakes Steamer

The awarding of a contract for a new steamboat to cost over $1,000,000 to be operated exclusively as an inter-plant cement carrier on the Great Lakes has been announced in Detroit marine circles. The new steamer is to be built at the River Rouge yard of the Great Lakes Engineering Works for the Huron Transportation Company, a subsidiary of the Huron Portland Cement Company, with head offices in Detroit.

The over-all length of the new bulk carrier will be 400 feet, the announcement states. With a beam of 60 feet and a molded depth of 29 feet, the carrying capacity will be about 7,500 tons, making the new ship about the size of the John W. Boardman and much larger than the Samuel Mitchell of the company's fleet.

Driving power will be provided by a triple expansion engine of approximately 2,000 horsepower. Three Scotch boilers 13 feet in diameter and 11 feet long will supply steam for the engine.

The steamer will be supplied with a modern conveyor system and auxiliaries for loading and unloading bulk cargoes of cement.

The steamer Boardman is considered the best equipped ship of its kind on the Great Lakes at the present time, having been built and equipped after designs worked out mainly by the cement company's engineers.

The new ship when delivered about October 1 will be used as a cement carrier, operating between Alpena and other lake ports.

Trackage Laid at Dewey Plant Near Davenport

Unfavorable weather has not impeded progress on the construction of the Dewey Portland Cement Company plant, west of Davenport, Iowa. Four hundred men are employed. Five miles of railroad tracks are reported completed.

Dirt and clay excavated from the quarry site will be employed in an elaborate landscaping of the grounds.

F. H. Powell New President of Southwestern

Mr. F. H. Powell has been elected president of the Southwestern Portland Cement Company, Los Angeles, with plants at Victorville, Calif., El Paso, Texas, and Dayton, Ohio.

Mr. Powell succeeds Carl Leonardt, who died recently.

Plan State Cement Mill for Indiana

State Highway Commission Opposes Measure

Establishment of a state-owned and operated cement mill at the Indiana State Farm, at Putnamville, and arrangement for the use of the entire output by the state highway commission in the construction of roads under its management, are the outstanding provisions in a measure introduced in the Indiana House of Reprsentatives.

The measure, which is said to have the support of the Indiana Farm Bureau, calls for an appropriation of $250,000 for the current fiscal year and for one of $350,000 for the succeeding fiscal period, with which to place the plant in operation. Putnamville is in a region in central Indiana where several large cement mills are situated. The stone and clay in the Putnamville district are said to be adaptable for use in cement manufacture.

The output of the proposed state cement factory would be sold to the state highway commission at the exact cost of production, the bill provides. The highway commission uses several million bags of cement every year, buying the product from privately-owned plants and making it available to contractors engaged in paving state highways.

Prisoners at the State Farm would be compensated for their work in the proposed cement mill at the rate of $1.50 a day. On release the pay would be turned over to the prisoners or their dependents. The State Farm now operates a brick factory, producing large quantities of high quality brick, which is used there and in the other state institutions, the surplus being marketed.

Another report states that opposition of the state highway commission to legislation which would establish a state-owned mill was expressed by John D. Williams, director, in a conference with Governor Ed Jackson. It is understood Mr. Williams believes the plan is impracticable.

Ralph Howard, superintendent of the state farm, who accompanied Mr. Williams to the Governor's office, also expressed opposition to the cement mill plan.

It is understood Mr. Williams, whose department places contracts each year for thousands of barrels of cement for use on state roads, insisted that the cost to the state of operating the plant would be excessive and that the necessity of employing chemists and other experts would offset the cheap prison labor. Another argument against the state mill is that little prison labor would be used because cement manufacture is largely the work of machinery.

Advocates of the Duncan bill have pointed out that large quantities of stone on the state property could be utilized for cement manufacture.

Giant Portland Cement Official Issues 1926 Financial Report

The Giant Portland Cement Company reports net profits from operations, after depreciation and local and state taxes, for the year ended December 31, 1926, $584,911, as against $536,498 for 1925. President Charles F. Conn says to the stockholders in the annual report of the Giant Portland Cement Company:

"Results of manufacturing operations are shown in the financial statement herewith. The prospects for continued activity in construction are good, although your company's sales contracts are 25 per cent less than at January 1, 1926. European cement, made under wage conditions which could not and should not be duplicated in this country, is being freely used at a slight advantage in price, regardless of the fact that this action reduces the purchasing power which made the construction possible.

"Regular semi-annual dividends of 3½ per cent on the preferred stock were paid on June 15 and December 15; also 19 per cent in full of accumulated dividends on the preferred stock on December 15. Dividend disbursements for the year, as referred to above, amounted to $486.564. There is $1,871,400 preferred stock and $1,105,400 common stock outstanding."

Plant at Cowan, Tennessee, Nearly Completed

The Cumberland Portland Cement Company plant at Cowan, Tennessee, is reported to be in the final stages of construction. It is planned to manufacture both white and gray cement.

Machinery Being Installed in Indiana Plant

Work on the new cement plant at Stroh, Indiana, has progressed to the installation of machinery stage. An automatic loader for gypsum and a separator system are soon to be installed. Fineness of the cement to be manufactured there is expected to reach 90 to 92%.

Prosperous California Plant Pays 8 Per Cent Dividend

Rounding out another year, which he terms as exceptionally successful, Coy Burnett, president of the Monolith Portland Cement Company, Los Angeles, announced recently the fifth annual dividend of 8 per cent per annum to holders of common stock for the year 1926.

Michigan Plant Has 1926 Surplus

Figures on the operation of Michigan's state-owned cement plant at Chelsea, Mich., were given out at the final meeting of former Governor Groesbeck's administrative board to complete pending State business at the end of the year. According to the *Detroit Free Press* a loan of $400,000 was authorized for operating the prison industries through the winter and to cover a deficit in the Chelsea plant fund, in spite of the fact that the operating figures announced purported to show a large profit from the state's cement industry.

According to the announcement, a surplus of $973,000 was shown in the cement industry and the plant for which the state recently completed paying $500,000, is valued at $1,256,000, including all buildings, some of which were built by the state. Assets were listed at $1,926,500.

An audit made by a Detroit auditor shows gross sales of $2,043,000 for the period of the plant's operation by the state. Cost of sales is given as $1,422,946, leaving a gross profit from manufacturing of $616,085 after a deduction for returns and allowances. Selling expenses are listed at $64,608 and general and administrative expenses at $117,940. Discounts allowed amounted to $114,844. Other deductions and credits resulted in the announced net profit of $330,363.

Last August it was announced by the Michigan State Prison Commission that three offers had been received for the purchase of the Chelsea plant. The first offer was made by J. B. John, a well-known cement manufacturer, who bid $700,000. A second offer, an informal one of $750,000, was made by H. F. Jennings, of the Wabash Portland Cement Co., and a third company whose officials requested that the company's name be not mentioned, is credited with a bid of $800,000. The offers were received unsolicited, it was stated, and were all rejected by the members of the Board.

When the state's business was taken over by the present governor, it was announced that the people would be kept posted on the financial conditions of the state industries by audits of the accounts. The first audit was reported on January 10 as indicating a deficit of $236,941 in the state cement industry. This figure shown by the auditor-general "in red" is, according to former Governor Groesbeck, only money advanced by the state for working capital, and the audit of last December referred to as showing a surplus of about a million dollars.

L. L. Griffith, head of the Chelsea cement plant, and his son, L. L. Griffith, Jr., have been relieved of their duties by order of Gov. Fred W. Green. They remain on the payroll pending the outcome of the audit ordered by the governor, but are without power.

Cement Statistics for January

JANUARY production, shipments, and stocks of portland cement show increases over the corresponding period in 1926, according to the Bureau of Mines, Department of Commerce. Production shows an increase of over 4 per cent and shipments an increase of 5 per cent, as compared with January, 1926. Shipments of portland cement exceed those of January in all other years.

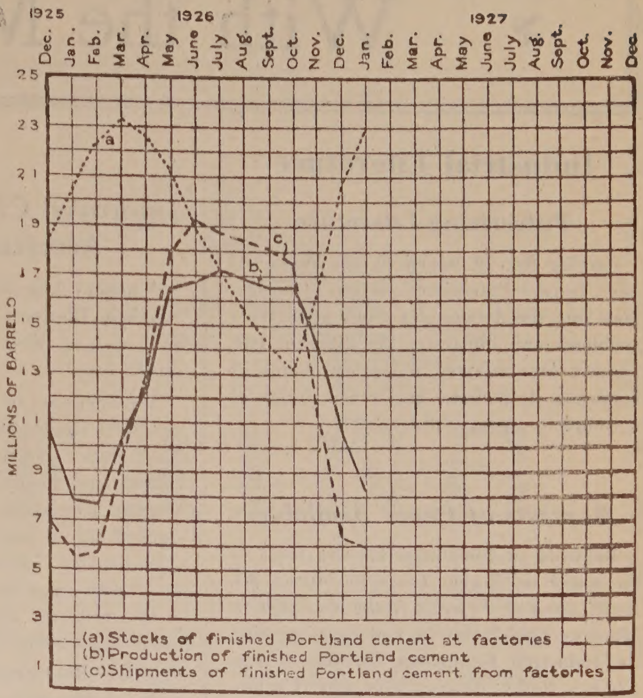
Portland cement stocks at the end of January, 1927, are over 11 per cent greater than at the end of January, 1926, and are exceeded only by those at the end of March, 1926.

Estimated Clinker (Unground Cement) at the Mills at End of Each Month, 1926 and 1927

(Figures represent thousands of barrels)

Month	1926	1927
January	9,074	10,037
February	10,931	....
March	12,290	....
April	12,967	....
May	11,695	....
June	10,144	....
July	8,604	....
August	7,362	....
September	6,112	....
October	5,370	....
November	5,748	....
December	*7,799	....

*Revised.



Production, Shipments, and Stocks of Finished Portland Cement, by Months, in 1926 and 1927

(Figures represent thousands of barrels)

Month	Production 1926	Production 1927	Shipments 1926	Shipments 1927	Stocks at end of month 1926	Stocks at end of month 1927
January	7,887	8,222	5,674	5,956	20,582	22,882
February	7,731	....	5,820	....	22,385	....
March	10,390	....	9,539	....	23,236	....
First quarter	26,008	....	21,033	....	....	....
April	12,440	....	12,965	....	22,710	....
May	16,510	....	17,973	....	21,255	....
June	16,866	....	19,134	....	19,000	....
Second quarter	45,816	....	50,072	....	....	....
July	17,134	....	18,812	....	17,301	....
August	16,995	....	18,583	....	15,718	....
September	16,571	....	18,087	....	14,188	....
Third quarter	50,700	....	55,482	....	....	....
October	16,596	....	17,486	....	13,334	....
November	14,193	....	11,276	....	16,243	....
December	10,744	....	6,432	....	*20,616	....
Fourth quarter	41,533	....	35,194	....	....	....
	164,057	....	161,781	....	....	....

*Revised.

Commercial District	Production—January 1926	Production—January 1927	Shipments—January 1926	Shipments—January 1927	Stocks at end of Jan. 1926	Stocks at end of Jan. 1927	Stocks at end of Dec., 1926*
Eastern Pennsylvania, New Jersey, and Maryland	2,765	2,510	1,469	1,422	3,805	5,122	4,034
New York	623	318	205	165	1,447	1,438	1,284
Ohio, Western Pennsylvania, and West Virginia	523	527	382	411	2,455	2,576	2,460
Michigan	292	448	212	261	1,994	2,085	1,898
Wisconsin, Illinois, Indiana, and Kentucky	542	923	476	461	3,574	3,444	2,982
Virginia, Tennessee, Alabama, and Georgia	961	899	845	921	966	1,173	1,196
Eastern Missouri, Iowa, Minnesota, and South Dakota	435	509	281	247	2,979	3,199	2,936
Western Missouri, Nebraska, Kansas, and Oklahoma	225	468	325	398	1,556	1,847	1,777
Texas	330	383	308	365	502	461	444
Colorado, Montana, and Utah	48	121	73	77	392	517	473
California	1,034	974	984	1,088	533	551	665
Oregon and Washington	109	142	114	140	379	469	467
	7,887	8,222	5,674	5,956	20,582	22,882	20,616

*Revised.

With the Manufacturers

Industrial Literature

Pulverizing Literature

Catalog No. 19 issued by the *Raymond Bros. Impact Pulverizer Company*, Chicago, goes into the details of various pulverizing problems and illustrates the different pulverizers best adapted to various kinds of materials. It includes also a description of a complete air-separating plant.

Reprints of Paper Available

Reprints in illustrated booklet form of the paper on "*Recent Developments in the Application of Tapered Roller Bearings in Machine Tools*" may be had by addressing the Industrial Equipment Division of The *Timken Roller Bearing Company*, Canton, Ohio. This paper was presented by Mr. S. M. Weckstein, Industrial Equipment Engineer of The Timken Company at the Machine Tool Section of the A. S. M. E. held in connection with the New Haven Machine Tool Exposition in 1926.

Traylor Bulletins

The Traylor Engineering and Manufacturing Company, in some of its literature, describes the Bulldog jaw crusher, equipped with the rod type of pitman, described in detail in Bulletin 1099. Its Dodge type of jaw crushers are featured in the loose-leaf Bulletin 1096.

"Norblo" Publication

"*Taking the Dust Out of Industry*" is the title of a new bulletin issued by the *Northern Blower Company*, Cleveland, Ohio. It is designed for the use of executives who wish to obtain a short, non-technical explanation of modern dust-collecting methods and of the advantages and limitations of various Norblo dust-collecting equipment.

Speed Reducer Catalog

Herringbone, spur gear, and worm gear speed reducers are featured in a new catalog published by the Foote Bros. Gear and Machine Company, Chicago. The purpose of the bulletin is to instruct in the correct lubrication of these reducers and to recommend the engineering services of a national oil firm when advice is required.

New Equipment

Improved Cloth Screen Dust Arrester Patented

A patent has recently been granted to Northern Blower Co., Cleveland, Ohio, for an improved dust collector of the cloth screen type.

The operation of the new Norblo units is generally similar to that of the older type. The cloth screens, stretched on wood frames and heavily reinforced across the filtering area by steel braces and wires, are stacked closely together; and the air, after releasing the heavier suspended particles by impact upon the baffle-plates in front of the dusty air chamber inlets, passes between the screens, through the fabric, and thence to the clean air chamber above.

The baffle plates, however, now extend the entire length of the dusty air chamber instead of merely facing the inlet pipes, and they therefore act more efficiently in stopping the heavier dust from reaching the screens.

The dividing compartment which separates the clean from the dusty air chamber has been strengthened sufficiently to permit a substantial walk-way or platform on its upper surface. This greatly facilitates inspection and maintenance of the screens.

New Type K-42 Shovel Produced by Link-Belt Co.

A new super-duty machine of 1¼ cubic yard capacity, known as the Link-Belt K-42 Shovel, with over-size brakes, clutches, drums and other working parts, is now being produced by Link-Belt Company, of Chicago.

The working parts of this new shovel are as large and liberal as in the machines sold for much heavier duty. It is not a 1 cubic yard machine "stretched" to 1¼ cubic yards, but rather, through its oversize equipment, permits readily of 1¼ cubic yard capacity operation under the most gruelling conditions.

All rope speed changes in the new Link-Belt K-42 Shovel are taken care of merely by changing the drum shells, to vary the drum diameter, and by changing the engine pinion. In this way the machine can very quickly and easily be converted from shovel to drag-line, crane, trench shovel, etc.

A very complete line of popular appurtenances, such as the boom for the drag-line, or general crane service, trench shovel and skimmer, are available for the K-42 Shovel.

Notes from the Field

Jeffrey Fifty Years Old

The Jeffrey Manufacturing Company, Columbus, Ohio, is celebrating its fiftieth anniversary. In 1877, in a one-room workshop, the firm began the manufacture of a machine for cutting coal mechanically, on which new types of chain for power transmission were used. Gradual developments were made both in the products and in the plant, and the present Jeffrey plant covers more than 60 acres of ground.

Explosives Meeting

An important technical convention of the Explosives Department of E. I. du Pont de Nemours & Company took place at the main office of the company in Wilmington, Delaware, January 25, 26 and 27. Reports from all fields where pellet powder is being used were made to the convention, as well as on the new permissible explosive of the company.

Chicago Sales Office

James L. Mayer and Frederick B. Oswald announce the opening of a sales office for industrial engineering equipment at 332 So. LaSalle St., Chicago, Ill. They are now representing the *Dings Magnetic Separator Co.*, and the *Saginaw Stamping & Tool Co.*, manufacturers of pressed steel overhead conveyor wheels, trolleys, and casters.

Fire Brick Distributors

The Botfield Refractories Company, Philadelphia, Pa, has appointed the following firms as distributors of its Adamant fire brick:

Southern Steel and Cement Company, Asheville, North Carolina; Henry A. Petter Supply Company, Paducah, Kentucky; Columbia Supply Company, 823 West Gervais Street, Columbia, South Carolina; Spartanburg Mill Supply Company, 218 Ezell Street, Spartanburg, South Carolina.

The WESTERN Institutional Idea

No. 1 of a Series

PIONEERING

CIVILIZATION pays homage to its pioneers, those sturdy souls who through daring and invention blaze new trails and smooth the path of progress.

For fifty years—from the crude days of the earth-moving and stone-handling industry's past—WESTERN WHEELED SCRAPER COMPANY has served as pioneer in creating and inspiring equipment known the world over and assisting in the great engineering projects of the times.

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FACTOR IN THE PROGRESS OF THE WORLD

With the Manufacturers

INDUSTRIAL LITERATURE

Crusher Catalog

A 24-page booklet entitled, *"Symons Cone Crusher,"* treats completely this new crusher. The Cone is said to be the result of a desire to combine the advantages of both the Symons horizontal and those of the vertical disc crushers. The Cone in action, its oiling system, its sizes and the parts used in assembly are comprehensively illustrated in this catalog, published by the *Symons Bros. Co.*, Chicago.

Controller Bulletins

Two new bulletins have just been published by the Electric Controller and Manufacturing Company, Cleveland, Ohio. Bulletin 1037-C describes Type B Limit Stops for use with alternating and direct current motors on electric cranes and any other motor-driven machine which must be automatically stopped when reaching a given position.

Fire Brick Suggestions

A few suggestions for increased service from fire brick are to be gleaned from a 16-page booklet, well illustrated with photographs showing application of "Adamant" cement. Quotations are also taken from some two dozen letters from users.

"The Hercules Mixer"

The especial announcement in the November issue of the *Hercules Powder Company* house organ, *"The Hercules Mixer,"* is the opening of the Development Department, in charge of *Mr. C. A. Higgins*. The function of this department will be to collect facts and make recommendations on subjects of general and economic interest.

Fire Brick Booklet

The Story of Kruzite and Mizzou is bound in an attractive cover descriptive of the region in which Diaspore, used in the manufacture of these fire brick, is found. The booklet concerns the quarrying and character of Diaspore, and is published by the *A. P. Green Fire Brick Co.*, Mexico, Mo.

NOTES FROM THE FIELD

Sargent Celebrates Anniversary

Nineteen twenty-seven marks the seventy-fifth anniversary of *E. H. Sargent and Co.*, of Chicago. Established in 1852, as a retail drug store, the early history of *E. H. Sargent and Co.* is beyond the memory of even the oldest men now in the organization. The first stock of laboratory equipment was kept in an old wardrobe in the rear of the store, and the entire investment in laboratory supplies at that time was a matter of a very few dollars. But with an increased demand for laboratory apparatus, the time came when the pharmaceutical department of E. H. Sargent and Co. became the lesser portion of the business and, in order to give proper attention to the growing industry, Sargent's Drug Store, representing the pharmaceutical portion of E. H. Sargent and Co.'s interest, was sold to other interests.

Moving several times, in each case to more commodious quarters, did not compensate for increased business until, a few years ago, when still larger and more convenient quarters of modern type in the new section of business on the north side of Chicago were purchased.

New Ass't Gen'l Manager

The Explosives Department of E. I. du Pont de Nemours & Company has announced the appointment of Mr. J. W. McCoy as assistant general manager of the department.

Canadian Removal

The *Electric Controller and Mfg. Company* of Cleveland, Ohio, announce the removal of their Toronto office from the Traders Bank Bldg., to 415 Metropolitan Bldg., Toronto, Ontario.

Dust Arrester for South Australia

The South Australian Portland Cement Company of Brighton, South Australia, has placed an order with the *W. W. Sly Manufacturing Company*, Cleveland, Ohio, for a large dust arrester, to be used at the baggers. Foreign orders from Cuba, Argentine, New Zealand and Norway also have been received recently.

At Chicago Power Show

A feature of the Diamond Power Specialty Corporation exhibit at the Chicago Power Show will be a miniature boiler. By means of this boiler, the principles of correct application of soot blowers to varying boiler conditions will be demonstrated.

Cleveland Extensions

The Cleveland Wrought Products Company, Cleveland, Ohio, have now completed extensions to their Plant No. 1, enabling them to maintain the output of their "Steelcraft" division of air-hammer pistons and bushings, rivet sets, etc.

Diamond Data

"The Diamond and Industry," on the industrial diamond and its many uses, and published by the *Wheel Trueing Tool Co.*, of Detroit, has been written primarily as an aid to the executive responsible for industrial costs and production where diamonds and diamond tools are in use.

The selection and care of diamonds, and the function of the diamond expert in his relation to industrial problems, is fully discussed. A copy of *"The Diamond and Industry"* will be forwarded on application by industrial executives.

Philadelphia Managers

The *Buffalo Forge Company* and *Buffalo Steam Pump Company* announce that beginning January 1, 1927, their Philadelphia office, in the Land Title Bldg., will be in charge of Mr. W. S. Koithan and Mr. R. W. Pryor, Jr., who have for many years been joint managers of the New York office. They will continue to manage the New York district, with an enlarged engineering organization.

Explosives Appointment

Announcement has been made by E. I. du Pont de Nemours & Company of the appointment of Mr. J. H. Wellford as director of high explosives manufacture in charge of all high explosives work.

Connecticut Office for Link-Belt

To maintain a closer contact in the New Haven territory, and to service the better their business in that district, the *Link-Belt Company* has established temporary headquarters in Connecticut's largest city, at 152 Temple Street.